

REMARKS

This paper is in response to the Official Action mailed October 29, 2003. In this response, claims 2, 4, 6, 9-14, 16 and 24 have been amended and claims 1, 5, 7 and 15 have been canceled. Claims 2-4, 6, 8-14 and 16-24 are now presented for the Examiner's consideration in view of the following remarks:

The Present Application

The present application is directed to a technique for providing quality of service (QoS) guarantees in a wireless local area network. More specifically, the application relates to providing a virtual stream in a basic service set in a wireless network.

In a preferred embodiment of the present invention, a virtual stream is set up by a QoS management entity in a point coordinator station of a basic service set. The QoS management entity reserves an associated resource of the basic service set for setting up the QoS session; specifically, that resource is a predetermined bandwidth of a communication link of the basic service set.

By utilizing a predetermined bandwidth as the reserved resource, the presently claimed system is able to base admission of a new virtual stream on the new bandwidth request and on current bandwidth availability. Bandwidth may further be partitioned into separate spaces for continuous/periodic flow type and discontinuous/bursty flow type, and allocated while considering the different bandwidth needs of those two spaces (see present specification at p. 20, line 3 – p.21, line 20).

Claim 9 of the present application has been amended to present it in independent form, incorporating all the limitations of its base claims 1, 5 and 7. Claims 9 is directed to a virtual stream in a basic service set in a wireless network, the virtual stream comprising a unidirectional path in the wireless network between a station sourcing a quality of service (QoS) session and at least one station receiving the QoS session in the same basic service set. The virtual stream is set up by a QoS management entity within a point coordinator station of the basic service set to transport, under at least one predetermined QoS constraint, a traffic of the QoS session from a local logical link control entity to at least one peer logical link control entity in the same basic service set. The QoS management entity of the point coordinator-station reserves an associated resource of the basic service set for the virtual stream set up for the QoS session. The reserved resource is a predetermined bandwidth of a communication link of the basic service set.

In another embodiment of the invention, the virtual stream identifier is associated with at least one QoS parameter selected from the group consisting of an acknowledgement policy, a flow type, a privacy level, a delay bound, a continuous flow type and a discontinuous flow type. In that way, virtual stream parameters may be placed in the classification table by the frame classification entity by placing the virtual stream identifier in the classification table (see present specification at p. 10, line 4 – p. 11, line 17).

Claim 16 of the present application has been re-presented in independent form to claim that embodiment of the invention. Claim 16 is directed to a virtual stream in a basic service set in a wireless network. The virtual stream comprises a unidirectional path in the wireless network between a station sourcing a quality of service (QoS) session and at least one station receiving the QoS session in the same BSS.

The QoS session includes at least one data frame, wherein the station sourcing the QoS session includes a frame classification entity that labels each data frame of the QoS session with a virtual stream identifier. The virtual stream identifier is associated with at least one QoS parameter value for the QoS session.

The at least one QoS parameter value is at least one of an acknowledgment policy, a flow type, a priority level, a privacy level, a delay bound, a jitter bound, a minimum data rate, a mean data rate, and a maximum data burst.

In the Official Action dated October 29, 2003, the Examiner has rejected all the claims under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,631,122 to Arunachalam et al.; and has further rejected claim 1 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,587,457 to Mikkonen.

The Arunachalam Patent

Arunachalam discloses a wireless QoS agent for an all-IP network. The QoS manager/agent is said to be a system that provides guarantees for certain parameters, including bandwidth:

In accordance with the teachings of the present invention, the QoS Manager/Agent provides additional guarantee to the QoS parameters, namely, delay, jitter, bandwidth and reliability, pertaining to user applications. The complexity of wireless link management centers around providing the flexibility of selecting various QoS provisioning techniques for next generation wireless systems and the future broadband wireless systems.

Arunachalam, col. 4, lines 60-67. Those parameters are results or goals sought by the QoS system of Arunachalam. They are NOT resources that are reserved in setting up a virtual stream.

Arunachalam discloses three resource usage policies considered in setting up links: (1) SLA (service level agreement) policies, tariff policies and fairness policies (Arunachalam, col. 5, lines 5-16).

The logical flow ID of Arunachalam is used solely as a unique identifier or tag for a logical QoS flow (Arunachalam, col. 8, lines 7-12). Its use is limited to routing (see, e.g., Arunachalam, col. 8, lines 57-61; col. 9, lines 45-65; col. 10, lines 20-23).

The Mikkonen Patent

Mikkonen discloses a method for supporting QoS in a wireless IP network.

Discussion

Independent Claim 9

Applicant respectfully submits that claim 9, now re-presented in independent form, is patentable over Arunachalam. Claim 9 requires that setting up a virtual stream includes the reservation of a predetermined bandwidth of a communication link of the basic service set. Arunachalam does not teach or suggest that limitation.

In rejecting claim 9, the Examiner sites the passage of Arunachalam quoted above. Applicants respectfully submit that that passage discusses those parameters that the QoS system

of Arunachalam guarantees, but does not discuss the reservation of a predetermined bandwidth by the QoS management entity of the point coordinator-station, as required by claim 9.

Applicant therefore submits that claim 9, and claims 2-4, 6, 8, 10-14 and 24, which depend from claim 9, are patentable for at least that reason.

Independent Claim 16

Applicant respectfully submits that claim 16, now re-presented in independent form, is patentable over Arunachalam. Claim 16 requires that the virtual stream ID carry information beyond a simple tagging function. Specifically, the virtual stream ID must include at least one QoS parameter selected from an acknowledgment policy, a flow type, a priority level, a privacy level, a delay bound, a jitter bound, a minimum data rate, a mean data rate, and a maximum data burst. Arunachalam does not teach or suggest associating any of that information with the virtual stream ID.

In rejecting claim 16, the Examiner points to a passage of Arunachalam wherein the QoS parameters are listed. Those include, for example, delay, jitter, bandwidth and reliability. Applicants respectfully submit that Arunachalam, however, does not teach associating the virtual stream ID with those parameters, as required by claim 16.


Applicant therefore submits that claim 16, and claims 17-23, which depend from claim 16, are patentable for at least that reason.

Conclusion

Applicant therefore asserts that none of the claims presented in the case are anticipated by or obvious over the relevant art. Applicant submits that the claims in the case are in condition for allowance, and earnestly requests that the Examiner issue a timely Notice of Allowance.

Should the Examiner have any questions regarding the present case, the Examiner should not hesitate to contact the undersigned at the number provided below.

Respectfully submitted,

By 
Robert T. Canavan
Reg. No. 37,592
Telephone: 908-707-1568

Canavan & Monka LLC
805 Partridge Drive
Bridgewater, NJ 08807

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